Physiol. Res. 61 (Suppl. 1): i, 2012

Foreword

It is a great pride and privilege that we can present this special issue of *Physiological Research* as a representative publication of the Institute of Physiology (Academy of Sciences of the Czech Republic, Prague). It is dedicated to a special topic, which is the ontogenetic approach to questions related to pathogenesis of serious civilization diseases, such as ischemic cardiac disease, epilepsy, hypertension and etc. The term "critical developmental period" was established in the world scientific literature by researchers of our Institute in the sixties of the last century. The pioneers in this research were Jiří Křeček, Jiří Jelínek, Bohuslav Ošťádal, Pavel Mareš and others. This approach currently represents a general biological law - the theory of "developmental time windows", which explains, why influencing the organism in the earliest phases of its development (both prenatally and postnatally) can determine many changes detected in the adulthood. It is evident that the mutual interaction of genetic and environmental factors plays a crucial role in this process. This developmental approach is not only practiced in our Institute, but also in a number of co-operations with other institutions as may be seen in the content of this issue.

Nowadays, epidemiological and experimental studies give the evidence that the early life, including perinatal period, is a critical time during which the alterations of structural and functional modeling have long-term consequences in relation to various diseases in adulthood. However, relatively little is still known about particular critical developmental periods in humans although the results from experimental animals are sufficient. There is no doubt, nowadays, that small birth size in human is associated with increased risk of cardiovascular diseases, whereas large birth size may predict increased risk of obesity and some cancers. Moreover, the results of many cohort studies suggested that birth weight was inversely associated with adult morbidity and mortality from cardiovascular diseases. According to the "developmental origin of health and disease hypothesis", these findings suggest that fetal undernutrition may increase susceptibility to diseases that occur later in life.

Therefore, the aim of this special issue was to publish some articles on the developmental aspects of different disciplines. We would like to express our special thanks to all authors who had actively contributed to this special issue.

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Guest Editors